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EXAMINER

LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,132

Applicant(s)

BRIST ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08-16-2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

22

Art Unit: 1775

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-18, drawn to an article, classified in class 428, subclass 195.1.
 - II. Claims 19-29, drawn to a method of making an article, classified in class 427, subclass 372.2.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a different process such as by silk screen printing a printed wiring board surface with a thermochromatic material. The process as claimed can be used to make a different product such as a piece of jewelry.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Atty: Suk Lee on May 16th 2005 a provisional election was made with traverse to prosecute the invention of group I, claims 1-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-29 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference numerals **160** and **115** have both been used to designate a solder mask layer (on page 10 Line 10-11). Also, numeral **162** in Fig 3B is not described anywhere in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

7. Claims 1, 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is vague and indefinite as to where "near the carrier" is referring to?

In claim 10, it is vague and indefinite as to where "near the solder mask layer" is referring to? From the Figures, the thermochromatic material is directly coated over the solder mask layer (Figs. 1, 4-5).

Claim 8 is structurally indefinite. Clarification is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1, 2, 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Arnaud et al (US 6872453).

Arnaud discloses a thermochromatic coated layer comprised of a substrate having a conductive layer and a thermochromatic layer.

The examiner takes the position that the substrate having a conductive layer resembles a printed circuit board since the conductive layer is connected to an electrical supply (col 6 L 1-6, L 51-55).

10. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Larson (US 6229514).

Larson discloses a display comprised of a substrate (2), electrode patterns (4,5) and a visualization medium (8); all in the named order.

The visualization medium (8) is temperature sensitive and changes color upon heating of the electrodes (col 5 L 10-17).

The examiner takes the position that the electrodes on the substrate resembles a printed circuit board and the visualization medium resembles the thermochromatic coating.

11. Claims 1-3, 6, 9-13 and 18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Parker (US 4922242).

Parker discloses a thermochromatic material coated substrate comprised of electrodes, a pigment layer, a substrate, a mask and a thermochromatic material.

Electrodes (122,122') are formed onto both surfaces of the substrate (121) wherein the substrate is a resistive element (col 3 L 3-34). A mask (7) having a cutout pattern is placed adjacent to the first surface of the substrate (col 2 L 64-68). The thermochromatic material is applied to the second surface of the substrate (Fig. 2).

The thermochromatic material can be a liquid crystal (col 5 L 21-23). At the transition temperature, the thermochromatic material changes from opaque white to transparent (col 5 L 38-39).

The examiner takes the position that the electrodes on the resistive element is equivalent to a printed circuit board and the electrodes resemble the signal layer.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (US 4922242) or Arnaud et al (US 6872453) or Larson (US 6229514) in view of Rait (US 6880396).

Parker, Arnaud and Larson all teach an electronic device having a liquid crystal thermochromatic material coated over the device.

The prior art references however do not teach the solder mask is transparent, nor do they teach the particular arrangement as in claim 16. The prior art also do not teach the thermochromatic material can be a leucodye or an N-isopropylacrylamide compound.

Rait teaches a liquid level indicator which is used for monitoring the amount of liquid in a container.

The liquid level indicator is a leucodye ink which is a thermochromatic material that exhibits vivid color changes with slight changes in temperature. The leucodye ink is to replace the conventional liquid crystal thermochromatic material (col 4 L 51-67).

In view of the prior art teachings, one skill in the art would changes the arrangement slight and choose leucodye ink, liquid crystal or N-isopropylacrylamide as a thermochromatic material because the arrangement can be modify according to one's desire and these claimed thermochromatic materials exhibit color changes upon changes in temperature.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam
Primary Examiner
Art Unit 1775